SELF-FEEDERS for HOGS

UNIVERSITY OF ILLINOIS
COLLEGE OF AGRICULTURE
EXTENSION SERVICE IN AGRICULTURE AND HOME ECONOMICS

Circular 562

CONTENTS

PLANS FOR FEEDERS

(*NOTE — The number of board feet given is for construction entirely with lumber and according to the plans. Some allowance is made for waste in cutting and matching the boards.)

Questions relating to blueprints, plans, and construction can be addressed to the DEPARTMENT OF AGRICULTURAL ENGINEERING, and inquiries on feeding and production to the DEPARTMENT OF ANIMAL HUSBANDRY, COLLEGE OF AGRICULTURE, UNIVERSITY OF ILLINOIS, URBANA, ILLINOIS.

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SELF-FEEDERS FOR HOGS

Their Construction and Use

By Deane G. Carter and W. E. Carroll[1]

SELF-FEEDERS are standard equipment for hog production. They are most commonly used for whole or ground grain, mixed feed, and supplemental mixtures. Except where otherwise indicated, the feeders referred to in this circular are the kinds used for those feeds. Such feeders are more complicated in design and require more careful construction and adjustment than the self-feeders used for mineral mixtures, ear corn, and legume hay.

Self-feeders save labor, they are convenient, and they promote rapid and efficient gains. Much less labor is needed to fill and care for them than to hand-feed hogs. In a test reported by the Arkansas Station, hand-feeding required about three times as much labor as self-feeding. Self-fed hogs usually finish for market somewhat more quickly than hand-fed hogs, yet they require no more feed for each pound of gain (*see table on next page*).

Hoppers for self-feeders can be filled whenever weather and ground conditions are favorable or between periods of heavy field work. Then the feeders need only brief daily attention.

USING THE SELF-FEEDER

Hogs are successfully fed with self-feeders for several reasons: their appetites are persistent and regular even when they are on full feed; they can eat large amounts without injury; they are not easily thrown off feed; and their bodies can economically convert large amounts of feed into body tissue and fat. Good judgment and care are nevertheless required when using self-feeders for hogs.

Self-feeders are used to best advantage for market hogs of any age on full feed, but they can also be used successfully with breeding stock and pregnant sows. Suckling pigs can be self-fed in a creep from which older hogs are excluded.

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[1]Deane G. Carter, Professor of Farm Structures, Department of Agricultural Engineering; and W. E. Carroll, Professor of Swine Husbandry, Department of Animal Husbandry.

FREE-CHOICE SELF-FEEDING vs. HAND-FEEDING FOR PIGS[a]

Average daily ration	Average daily gain	Feed for 100 pounds gain		
DRY-LOT: 24 tests with 480 pigs averaging 95 pounds at start				
	lb.	Corn *lb.*	Supplement *lb.*	Total *lb.*
Self-fed				
Corn, 5.6 pounds Supplement, .94 pound	1.59	355	59	414
Hand-fed				
Corn, 5.1 pounds Supplement, .93 pound	1.42	359	66	425
PASTURE: 9 tests with 170 pigs averaging 58 pounds at start				
	lb.	Corn *lb.*	Tankage *lb.*	Total *lb.*
Self-fed				
Corn, 4.6 pounds Tankage, .38 pound	1.32	340	27	367
Hand-fed				
Corn, 4.2 pounds Tankage, .28 pound	1.20	341	23	364

[a]Data from *Feeds and Feeding*, by F. B. Morrison, 20th ed. 1936.

Fattening Hogs

Hogs eat more and make the most rapid gains when feed is before them at all times. This is especially true when corn and palatable supplements, such as tankage, meat scraps, fishmeal and certain mixed supplements are fed free-choice. Some supplements, such as linseed meal, are so unpalatable that hogs will not eat them readily; others, such as soybean meal, are highly palatable and will be eaten too freely. The only way to control consumption of such supplements in a system of self-feeding is to mix them with other feeds.

Suckling Pigs

Any mixture or variety of dry feeds suitable for trough-feeding suckling pigs may be used in the self-feeder. A ration that can be fed before weaning and for a few weeks afterward consists of shelled corn, hulled oats and a suitable protein supplement such as two parts of tankage or meat scraps, one part of soybean meal, and one part of alfalfa meal. Altho in nutritive value they do not equal the standard trio mixture (2 parts tankage or meat scraps, 1 part soybean meal, and 1 part alfalfa meal), the following supplements will be found fairly satisfactory for young pigs when protein feeds of animal origin are scarce.

Supplements for Young Pigs

(Minimum of animal protein: used with a mineral mixture fed free-choice)

	A	B	C	D	E
	lb.	*lb.*	*lb.*	*lb.*	*lb.*
Meat and bone scrap[a]	6	6	6	6	6
Wheat middlings	10	..	..	..	..
Soybean meal	60	50	59	60	69
Linseed oilmeal	5	10	..	10	..
Cottonseed meal	5	10	10	..	..
Alfalfa meal[b]	14	24	25	24	25
Total	100	100	100	100	100

([a]Digester tankage, meatmeal, or fishmeal. [b]For feeding on pasture, the alfalfa meal should be omitted.)

Hulled oats, altho an excellent feed for young pigs, may be too expensive to use freely. They are probably worth 10 to 15 percent more a pound than corn in the mixture. Young pigs prefer corn and hulled oats that are not ground.

Brood Sows

On most Illinois farms, it is more convenient to self-feed brood sows uncut legume hay in a rack and hand-feed ear corn and protein supplement rather than to self-feed the entire ration. Pregnant sows and sows suckling litters can be self-fed, however, if care is exercised in selecting the ration.

For self-fed pregnant sows, one-fourth to one-third of the ration should be made up of alfalfa hay or some other legume hay of good quality. It is necessary to chop or grind the hay and grind and mix the entire ration in the desired proportion to get the sows to eat the needed roughage. If oats are used with the corn, less hay will be needed. The proportion of corn should be so regulated as to bring the sow to farrowing time in a strong, vigorous, but not overfat condition.

The following mixtures have been fed successfully to pregnant sows:

Rations for Self-Feeding Pregnant Sows

	A	B	C	D
	lb.	*lb.*	*lb.*	*lb.*
Corn (coarsely ground)	62	40	63	35
Oats (coarsely ground)	..	35	..	40
Soybean meal	..	..	4	..
Soybeans (coarsely ground)	5	..	..	..
Legume hay (chopped or ground)	33	25	33	25
Total	100	100	100	100

It is normally safer to hand-feed nursing sows the first two weeks after they farrow. When self-feeding begins, the mixture should contain bulky feeds such as ground oats, wheat bran, and alfalfa meal to the extent of one-third to one-half of the total weight. By the time

the pigs are three or four weeks old, the ration for the sow can gradually be changed to whole corn and protein supplement fed free-choice. If pasture is not available, good quality alfalfa meal should make up about 10 percent of the total ration.

Self-fed sows usually finish lactation in better condition than hand-fed sows and are therefore ready to be rebred at once in the two-litter system or, if they are to be marketed, can quickly be put into market condition.

MANAGING THE SELF-FEEDER

Give daily attention. While self-feeders save labor and keep an adequate feed supply on hand without the routine required by hand-feeding, they are not a substitute for intelligent watchfulness on the part of the man in charge. Self-feeders need to be inspected daily to make certain that feed is not being wasted or that the feeder has not become clogged.

If more than one feed or feed mixture is being used, there should be a supply of each kind before the hogs at all times. Otherwise the hogs eat too much of the available feed. This may reduce the rate of gain and increase the consumption of a more expensive feed.

Keep painted and repaired. Feeding equipment will last longer if it is kept painted and in good repair. Broken boards should be replaced, nails and bolts kept tight, and new runners or skids put on before the old ones rot. A coat of hot asphalt or creosote applied occasionally to the bottom and to the runners will lengthen the life of these parts. In muddy weather feeders need frequent cleaning.

Where to locate. Since self-feeders are movable, they can be transferred from one place to another with the season and the need. It may be advisable to put them under shelter in winter or whenever they are likely to be clogged with snow and mud. To cut down feed waste and help to keep feeders clean, they should be placed on a wooden or concrete platform or on a feeding floor. They should be moved often enough to prevent mudholes.

A feeder for ear corn should always be set on a platform, and it is well to fence it off in a small area with only one entrance. This will make it harder for the hogs to carry away the ears of corn and scatter them. If the hogs are inclined to pull too much corn out of the feeder, the openings can be covered with boards until the hogs clean up the corn on the ground.

The self-feeder and the watering devices should be placed near each other, at least for fattening hogs, or gains will be slowed down. Hogs eating dry feed will drink frequently, given the chance. If the

water is not near the feeder, they will either spend time and energy in travel or reduce their need for water by eating less feed.

SELECTING A SELF-FEEDER

Whether the self-feeder is homemade or purchased ready-made, it must have certain essential parts and meet certain requirements.

Essential Parts

Ear-corn and hay feeders are relatively simple, consisting principally of a rack, or hopper, and a trough. Feeders for whole or ground grain or mixed feed need five parts — hopper, trough, agitator, spreader, and adjustable throat. An understanding of these parts and how they work will help in selecting a feeder.

Hopper. The most widely used type of hopper is V-shaped with flaring sides. The narrow bottom permits a better arrangement for the divider and throat adjustment. The flaring hopper also protects the trough better than a straight-sided hopper does.

Trough. The trough should be about one foot from front to back and not over 4 inches high at the front. One foot of length is needed for each feeding space. There should be no sharp corners in the trough where feed can lodge and spoil. If the feeder is correctly adjusted, only a small amount of feed is let down into the trough at any time, making it necessary for the hog to hold its head entirely over the trough while eating. Trough guards or lids are recommended.

Agitator. A number of methods have been developed for agitating the contents of the hopper to prevent clogging. One of the simplest is to hinge the bottom board of the hopper and attach pieces of wood to it in such a way as to project into the feed space.

Spreader or divider. This consists of an A-shaped piece on the floor of the hopper. It deflects the feed to the trough and makes it possible to secure a finer adjustment in the flow of the feed.

Adjustable throat. The flow of feed is regulated chiefly by moving the bottom board of the hopper up or down and then clamping it into place.

Requirements for a Self-Feeder

Capacity. A single-trough feeder 4 or 5 feet long affords enough space for 10 to 15 fattening hogs. A 5-foot double-trough feeder will accommodate 30 to 40 head. For larger herds two or more 5-foot feeders are generally better than a single larger one if shelled corn or ground feed is used. Feed hoppers range in capacity from about 10 bushels to 30 to 35 bushels of shelled corn or ground feed and 30 to 75 bushels of ear corn. Hopper capacity is calculated by counting 1¼

cubic feet for each bushel except when ear corn is used. Each bushel of ear corn occupies about 2½ cubic feet.

Durability. Self-feeders should be built of materials that resist decay and should be kept tightened and painted. Substantial braces, runners, and framing are needed to stand the strain of rough use and frequent moving. A wide low feeder is not easily upset either by the wind or by hogs.

Reliability. A feeder should maintain a constant feed supply with only once-a-day attention. Those who purchase ready-made feeders should look for tight construction, accurate adjustment of the throat or opening that controls the feed supply, a trough of suitable shape, trough lids and hopper cover, agitating devices to prevent clogging, and other provision to reduce waste of feed.

BUILDING THE SELF-FEEDER

Farmers who prefer to construct their own feeders can build the kinds illustrated here with the tools they usually have at hand, but a faster and more accurate job can be done in a well-equipped farm shop. There is an increasing tendency, however, for farmers to purchase their feeders ready-made. Most of the feeders shown here are suitable for producing in quantity on a commercial scale either in parts or completely prefabricated.

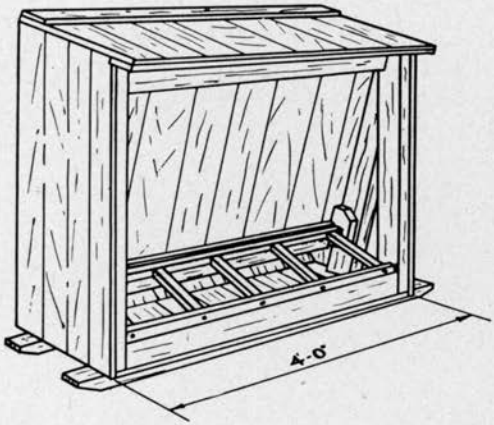
Materials Needed

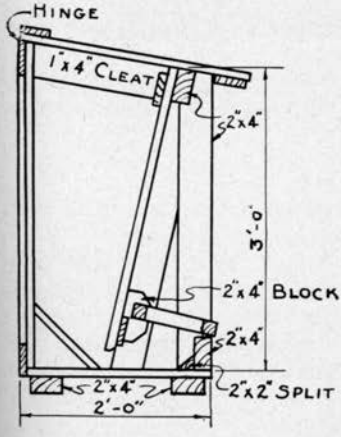
The approximate number of board feet of lumber required for constructing each of the feeders illustrated in this circular is given on page 2.

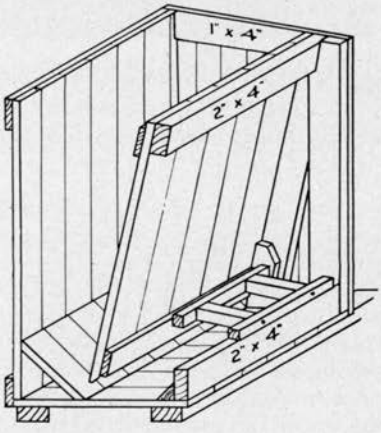
A change in the plan, the use of a different material, or any other alteration will change the amount of material needed. Frequently old or salvaged lumber can be used for some parts. For the hopper and the cover of the self-feeders, other materials may be used instead of 1-inch lumber. Several kinds of hard panel fiber or asbestos boards, plywood, or metal can be used whenever they are available. Each feeder will require some nails, hinges, bolts, or roofing materials, the amount depending upon the type of construction.

Plans for Self-Feeders

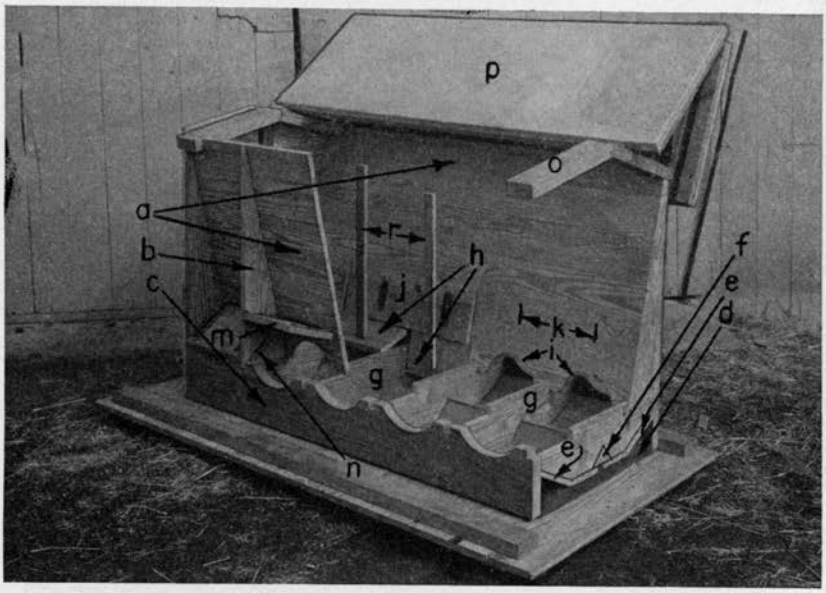
The plans on the following pages are detailed enough to serve as a guide to construction. In most cases some trial cutting and fitting will be necessary to get a good job. If plans are wanted that show greater detail in measurements, materials, and methods, blueprints may be secured from the DEPARTMENT of AGRICULTURAL ENGINEERING, UNIVERSITY of ILLINOIS, Urbana.







SMALL FEEDER *(Plan 118)*. For small herds of 10 to 15 head of fattening stock. Capacity, 8 bushels. Single trough; ladder-type guard over trough protects feed.

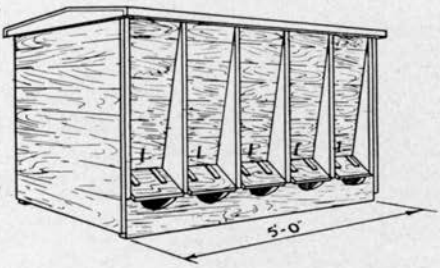


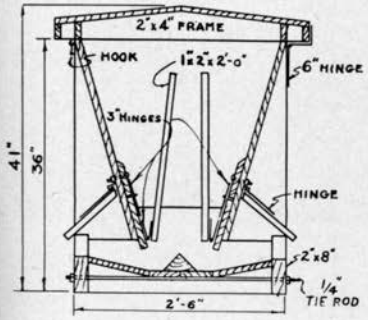
ILLINOIS SELF-FEEDER ***(Plan 412).*** This feeder can handle shelled corn and ground feed equally well. It is large enough to take care of 30 to 40 hogs; capacity, 25 bushels.

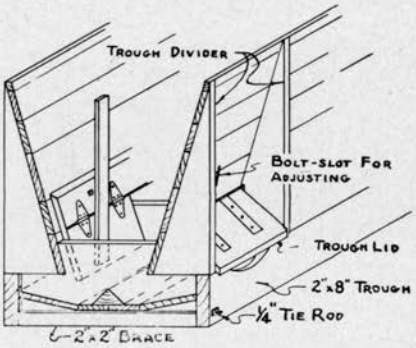
The hopper sides (**a**) are made from matched boards or a rigid sheet panel. Stall partitions (**b**), cut from 1-by-8-inch boards, are set into a ¾-inch notch in the trough front. They support the hopper sides. The trough front (**c**) is made of 2-by-8-inch material cut to shape as shown. A 2-by-2-inch piece (**d**) is used as a part of the frame of the feeder. The two outer floor boards (**e**) are sloped to reduce space where feed would accumulate and become stale. A triangular spreader or divider (**f**) can be cut from a 4-by-4-inch piece or built from 1-inch boards. Partitions across the trough and bottom of the feeder (**g**) are made from 1-by-10-inch material.

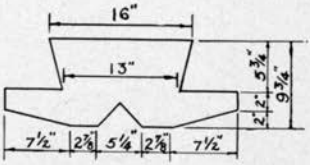
Circular cuts (**i**) in the bottom part of the hopper side give the pigs access to the agitators. The agitators (**h**) are cut to fit between the partitions, and each pair is hinged to a piece of 1-by-6-inch material (**j**) that is bolted to the hopper side thru slots (**k**). Pieces of 1-by-2-inch material (**r**) are hinged to the agitator to prevent the feed from clogging.

Two pieces of strap iron are attached to the trough lids (**m**) and looped around a ¼-inch rod at the top to form a hinge. Cleats 1 by 1 inch (**n**) are attached to each side of the partitions to support the lid, to help shed rain, and to prevent feed from being rooted out of the trough. The two pieces of the folding lid (**p**) are hinged together so that one edge overlaps the other and makes the crack rainproof. The lid is hinged to the feeder by fastening it to the rafters (**o**) at the side. (A one-piece lid is shown in the drawing on the opposite page.) The ends of the self-feeder are matched boards or panels.

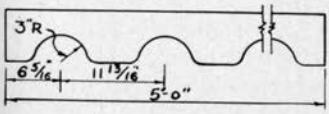




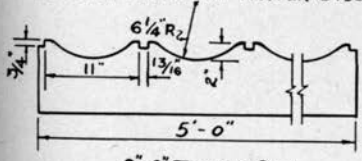




PARTITION

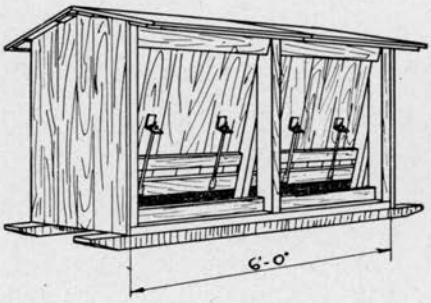


BOTTOM BOARD OF HOPPER SIDES

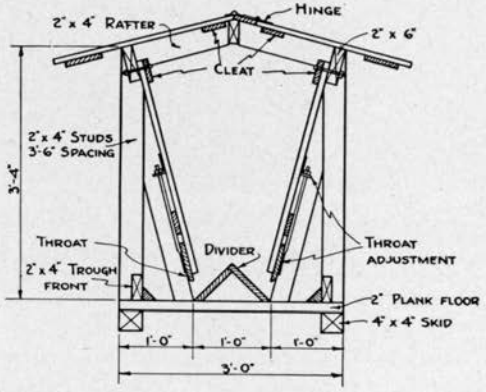


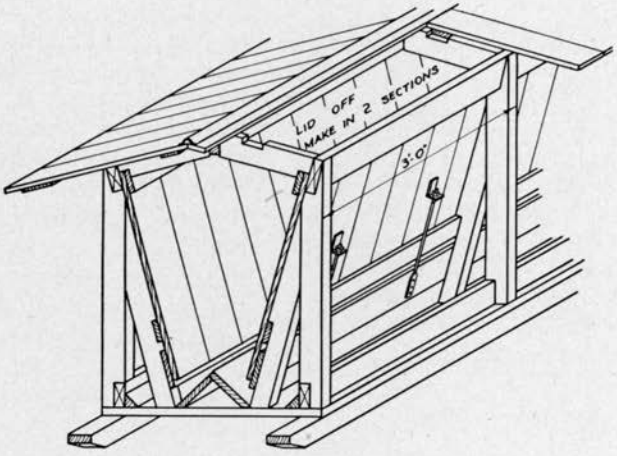
2"x8" TROUGH SIDE

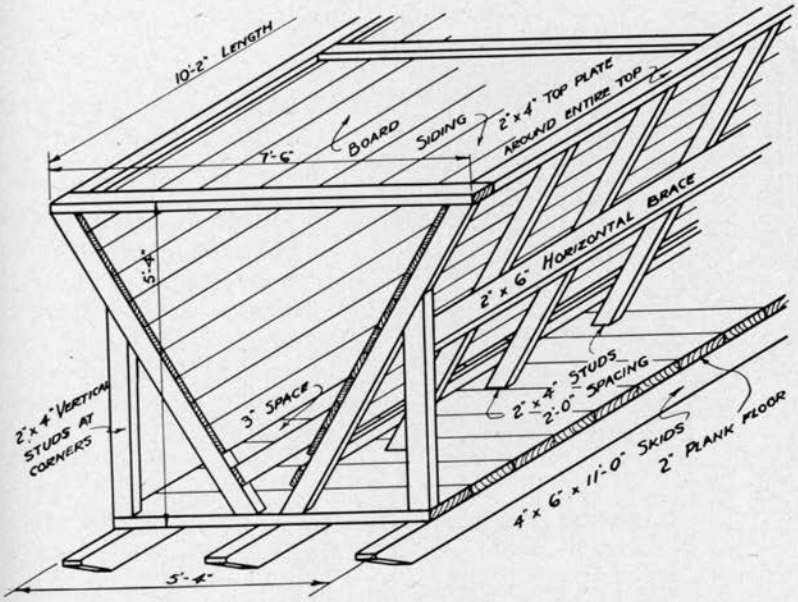
Further details of construction of Illinois self-feeder (with one-piece lid). This feeder, developed at the University of Illinois, was designed especially for use in experiments where the waste of feed had to be held to a minimum. In practical use since 1927, it has proved very dependable. When properly adjusted, it almost completely prevents feed waste. The cutaway view on the opposite page shows the general construction.



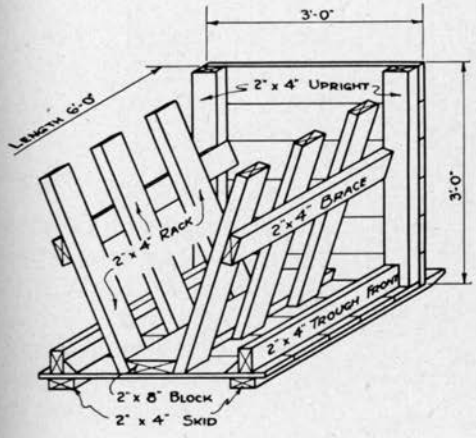
FEEDER FOR GRAIN OR GROUND FEED (*Plan 119*). Similar in design to Plan 412, but has fewer special features.



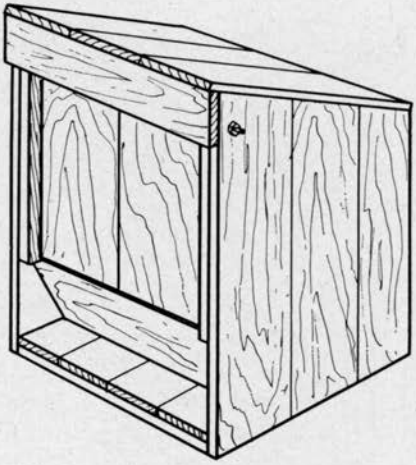




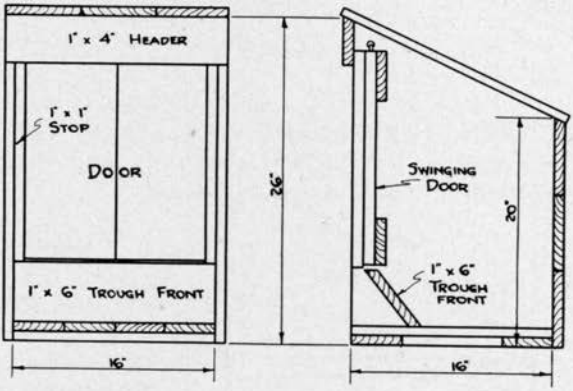
V-SHAPED OPEN HOPPER FOR EAR CORN (*Plan 426*). Low cost, simple to construct, and saves labor in a large herd. Should be set on plank platform. Holds about 75 bushels.

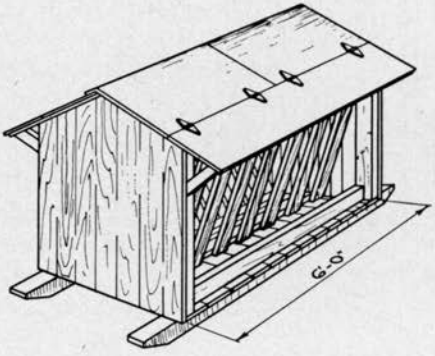


OPEN RACK FEEDER FOR ALFALFA (*Plan 776-16*). Similar to Plan 123, pages 14 and 15, except for the cover. Space the slats 5 inches apart.

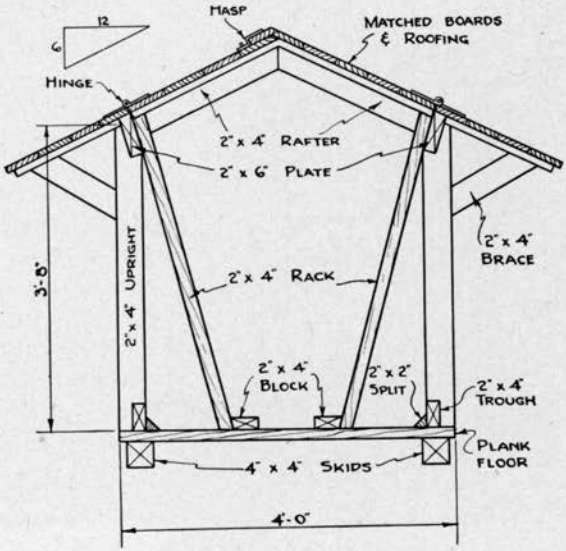


MINERAL-SUPPLEMENT FEEDER (*Plan 431*). This device, which protects the mineral mixture from dirt and prevents waste, is better than the open box often used.

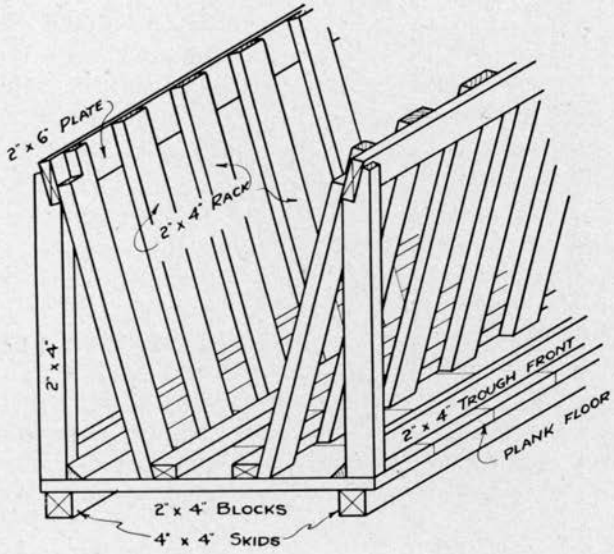


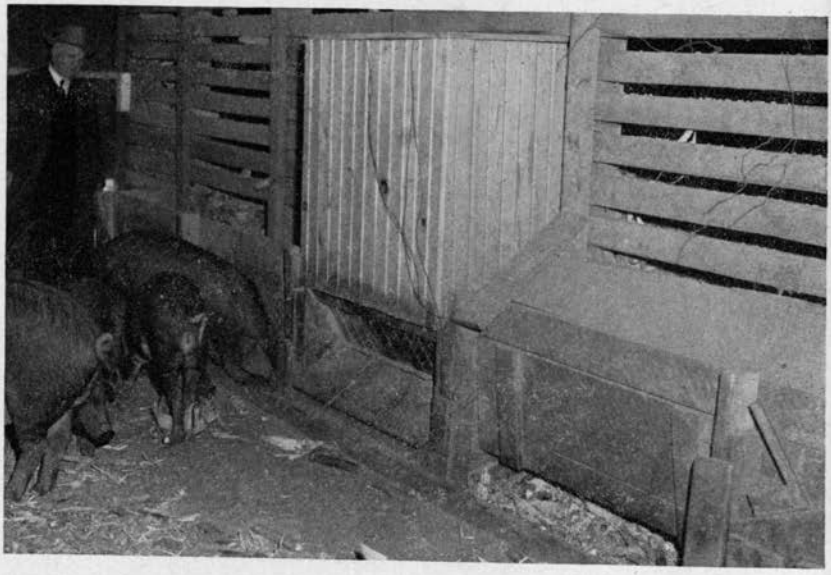


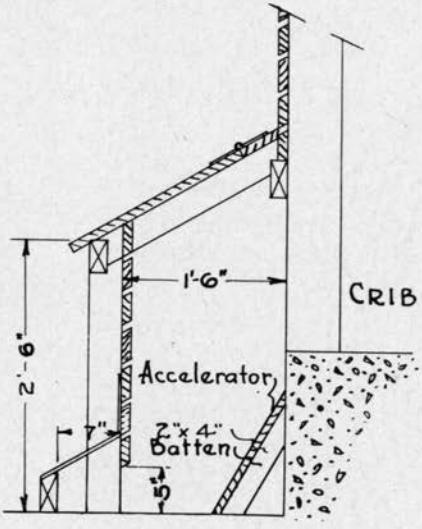
ENCLOSED FEEDER FOR LEGUME HAY (*Plan 123*). The cover can be built in various ways just so it provides good protection for the hay. Space the slats 5 inches apart. See further details on next page.



(Enclosed feeder, concluded)







ATTACHMENT FOR FEEDING EAR CORN FROM CRIB. This attachment is built along the outside or in the driveway. The lower boards are removed from the crib to permit the corn to fall into the feeder attachment.

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